The CloudNets Network Virtualization Architecture

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Teil I

CloudNets Architecture

THe CloudNets Ecosystem

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- FleRD: a resource description language for both virtual networks and substrate networks.
- `cloudnets-framework`: Proof-of-concept implementation of the CloudNets-Architecture.
- Flerdit: an editor for FleRD (currently under development)

CloudNets: Hierarchy Of Roles

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- PIP: operates a physical substrate.

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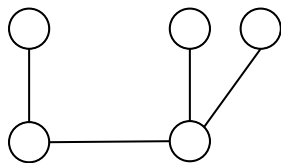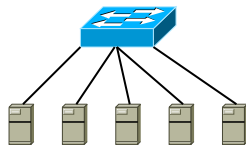- *Mapping Layer* graphs map from VNet to substrate.
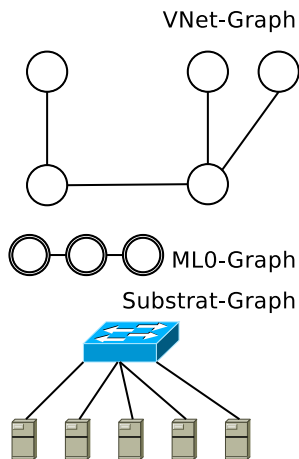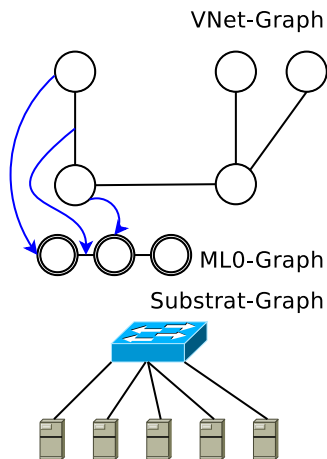
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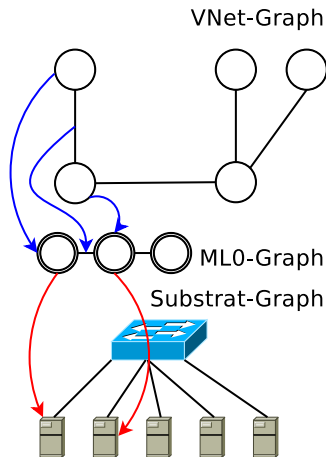
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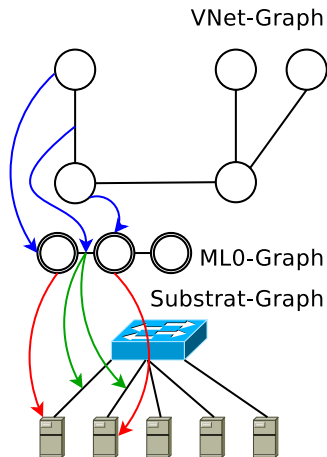VNet-Graph

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Teil II

FleRD: Flexible Resource Description

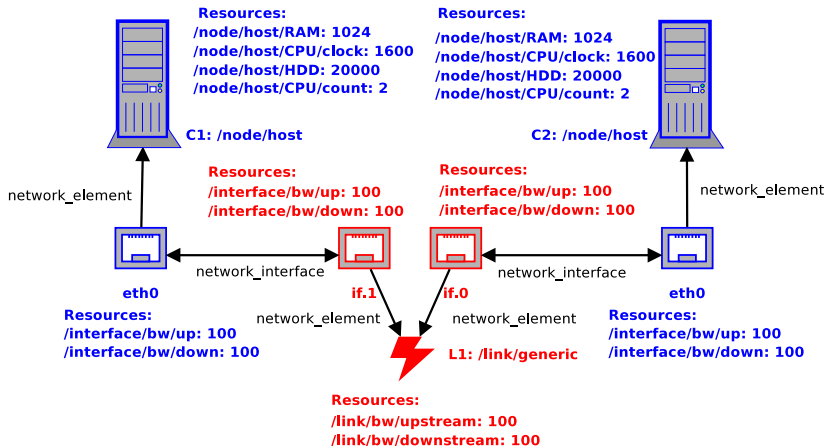# The FleRD Resource description language

Types of graphs

- UL (Underlay): describes a role's substrate topology.
- OL (Overlay): describes a virtual network's topology.
- ML (Mapping Layer): maps a virtual network graph to a substrate graph.

Graph structure

- Vertices: NetworkElement-Objects (NE) - both links and hosts.
- Edges: $[0, n]$ NetworkInterface Objects attached to NetworkElements.

Example: VNet With 2 Nodes

Resources:
/node/host/RAM: 1024
/node/host/CPU/clock: 1600
/node/host/HDD: 20000
/node/host/CPU/count: 2

C1: **/node/host**

Resources:
/node/host/RAM: 1024
/node/host/CPU/clock: 1600
/node/host/HDD: 20000
/node/host/CPU/count: 2

C2: **/node/host**

network_element

network_element

Resources:
/interface/bw/up: 100
/interface/bw/down: 100

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/interface/bw/down: 100

network_interface

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eth0

if.1

if.0

eth0

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network_element

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Resources:
/interface/bw/up: 100
/interface/bw/down: 100

L1: **/link/generic**

Resources:
/link/bw/upstream: 100
/link/bw/downstream: 100

The CloudNets Prototype

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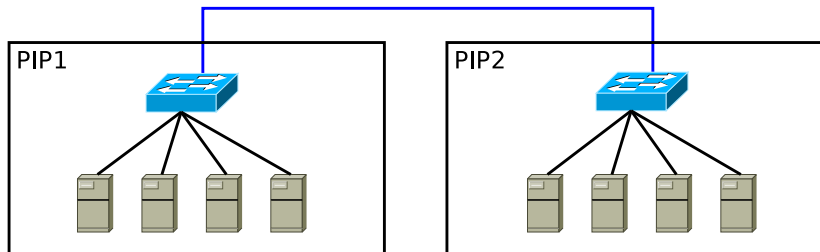
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- Host-Virtualisation: Xen and KVM.

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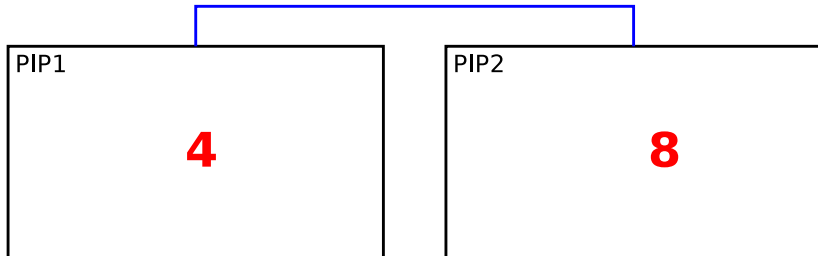- Link-Virtualisation: Currently VLANs, OpenFlow planned.
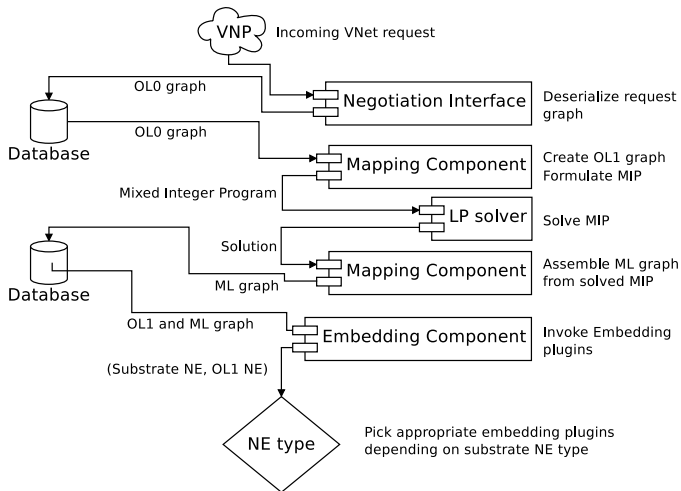
Substrate on the VNP level
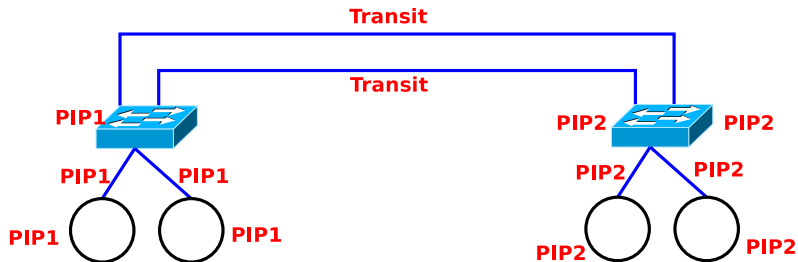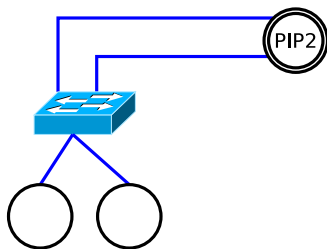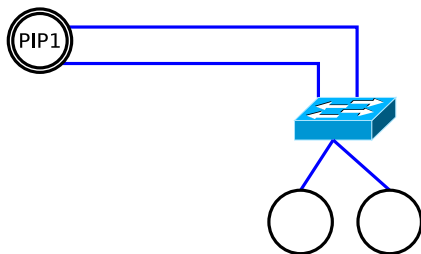
Try `cloudnets-framework`!

Source available on our project page

`https://projects.inet.tu-berlin.de/projects/cloudnets-framework/`

Thank You!